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number : **10-311223**(71)
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UBUKAWA SATOSHI****(54) NONAQUEOUS ELECTROLYTE BATTERY**

(57)Abstract:

PROBLEM TO BE SOLVED: To increase operation voltage, improve a low temperature characteristic and safety, and reduce gas generation, by using a lithium containing composite oxide as a positive electrode material contained in a positive electrode packed in an external body together with a negative electrode and an electrolyte.

SOLUTION: A positive electrode material is a lithium containing composite oxide represented by formula: $\text{LiCo}_{1-x}\text{Nb}_x\text{O}_2$. In formula, $0.00001 \leq x \leq 0.05$, especially, $0.001 \leq x \leq 0.03$. Because discharge operation voltage increases by value higher than 0.1 V than that when cobalt acid lithium is used, a low temperature characteristic is improved. Preferably, using of imide salt represented by $\text{LiN}(\text{SO}_2\text{C}_2\text{F}_5)$ restrains decomposition of electrolyte salt, etc., in a high voltage state or a high temperature state. A mixing solvent mainly composed of ethylene carbonate is preferably used as a material mainly composed of graphite and the electrolyte. The positive electrode material is produced by mixing niobium oxide and cobalt oxide powders together, baking them in atmosphere at 600°C, adding LiOH, and baking, cooling, and crushing them under

oxygen partial pressure control atmosphere at 800°C.

JAPANESE

[JP,2000-138075,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL
FIELD PRIOR ART EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS EXAMPLE
DESCRIPTION OF DRAWINGS DRAWINGS

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CLAIMS

[Claim(s)]

[Claim 1]In a nonaqueous electrolyte battery with which it was loaded into an armor body, an anode containing positive active material, a negative electrode, and an electrolyte are $\text{LiCo}_{1-x}\text{Nb}_x\text{O}_2$ as the above-mentioned positive active

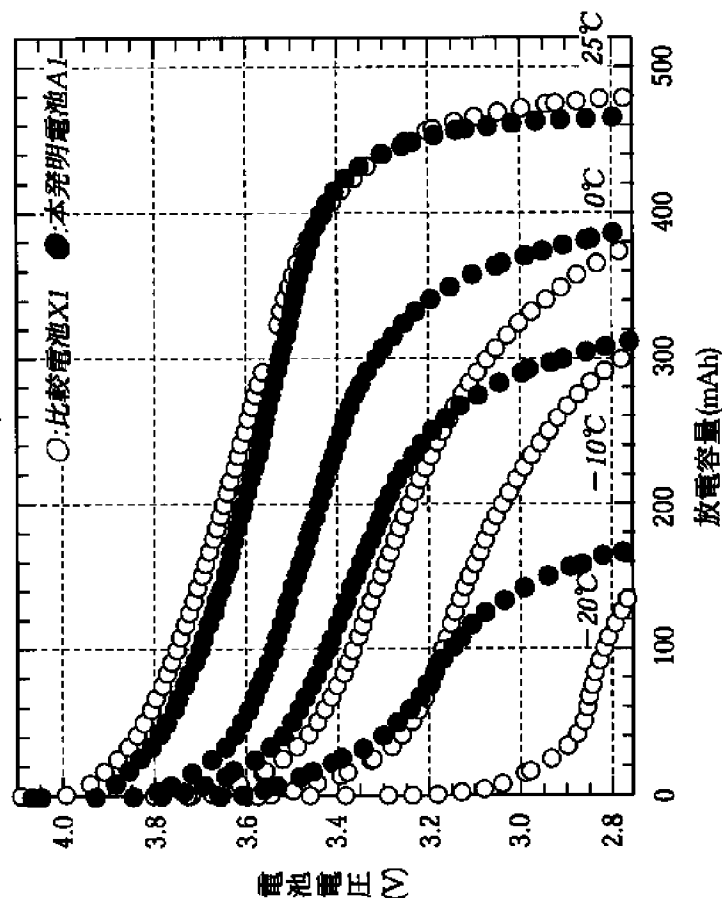
material. A nonaqueous electrolyte battery using a lithium content multiple oxide shown by $[0.00001 \leq x \leq 0.05]$ (especially $0.001 \leq x \leq 0.03$).

[Claim 2]The nonaqueous electrolyte battery according to claim 1 with which a mixed solvent which makes ethylene carbonate a subject as the above-mentioned electrolyte is used while using material which makes black lead a subject as the above-mentioned negative electrode.

[Claim 3]The nonaqueous electrolyte battery according to claim 2 using that in which an imide salt shown by structural-formula $\text{LiN}(\text{SO}_2\text{C}_2\text{F}_5)_2$ at least is contained as a salt of the above-mentioned electrolyte.

[Claim 4]The nonaqueous electrolyte battery according to claim 3 with which the above-mentioned armor body comprises a lamination armor body.

Drawing selection Representative draw



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[Claim 5]The nonaqueous electrolyte battery according to claim 1, 2, 3, or 4 which is a solid polymer of gel [electrolyte / above-mentioned].

[Claim 6]This niobium compound mixing cobalt oxide after calcinating cobalt oxide and a niobium compound and producing niobium compound mixing cobalt oxide as the above-mentioned positive active material, The nonaqueous electrolyte battery according to claim 1, 2, 3, 4, or 5 using a thing which is chosen from a lithium compound which comprises lithium hydroxide, lithium carbonate, and a lithium nitrate and which mixed a kind at least and also was calcinated.

[Claim 7]The nonaqueous electrolyte battery according to claim 1, 2, 3, 4, or 5 using what mixed niobium oxide and/or metal niobium to cobalt acid lithium, and also was calcinated as the above-mentioned positive active material.

[Claim 8]The nonaqueous electrolyte battery according to claim 1, 2, 3, 4, or 5 using what mixed a lithium niobium multiple oxide to cobalt acid lithium, and also was calcinated as the above-mentioned positive active material.

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